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The SALE of MILK Through HOME DISPENSERS

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INTRODUCTION

During recent years the use of home milk dispensers in households has increased. This report deals with some of the important features of this distribution system and the impact it has had on milk sales.

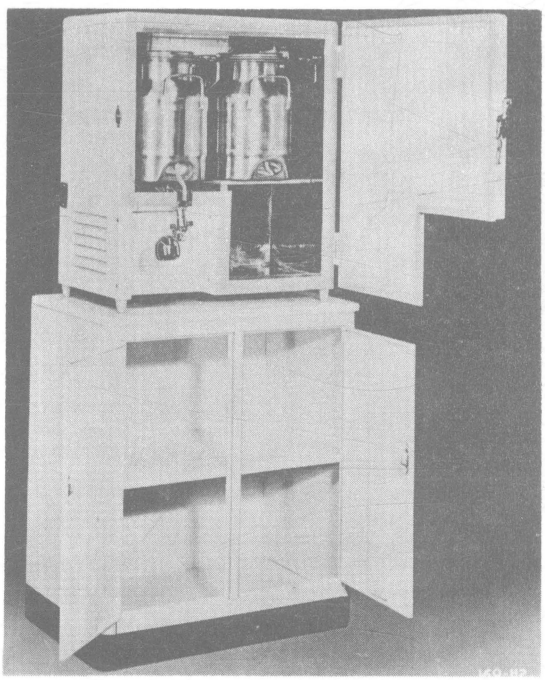

Figure 1. A Typical Home Milk Dispenser with Stand

Figure 1 shows a typical home milk dispenser. These units are placed in the home and dispense milk from a three gallon can.

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Previous reports indicated that family milk consumption increases after the installation of a home dispenser.[1] It has also been shown that as family size increases there is a tendency to purchase milk in larger containers and have a somewhat higher per capita consumption.[2] Opportunities to increase volume are of interest to all segments of the dairy industry.

METHODOLOGY

Two manufacturers of the bulk milk dispensers furnished names of eight milk distributors in Ohio using home milk dispensers.[3] Personal visits were made to these firms to obtain data pertaining to their operations and the names and addresses of their home dispenser customers. Three hundred ninety-five home dispenser customers were being serviced by these firms. Approximately 200 of these, for which names and addresses were available, were included in this study.

The respondents were contacted during the months of December, 1959, and January and February, 1960. Seventy respondents were contacted by telephone while an additional 33 completed a mail questionnaire. All customers not contacted by telephone received a mail questionnaire. Seventy-two reported weekly milk purchases before and after dispenser installation and the data from these families were used as the basis for determining changes in per capita consumption.

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[1] Norman Myrick, "Home Milk Dispensers in Action", American Milk Review, May, 1957, pp. 34-40; also see: Charles J. Dains, "Experience in the Use of Home Milk Dispensers", The Milk Dealer, September, 1959, pp. 68-9.

[2] Glen H. Mitchell and Elmer F. Baumer, "A Progress Report on Selected Aspects of Four Ohio Milk Distribution Systems", Ohio Agricultural Experiment Station, Wooster, Ohio, March, 1957, Research Circular 42.

[3] It was pointed out by one manufacturer that other Ohio distributors had purchased dispensers but the number sold to them was considered too small to include in this study.

All respondents reported their dispensers were installed within the last one and one-half years, ie. since July, 1958. The slight changes in family size that might have occurred in this short time period were thought to be insignificant. Therefore, no adjustments in consumption data were made for changes in family size.

Consumption data for any family reporting a dispenser installation within two months of the date of this survey were not included. This was necessary to offset the novelty associated with the installation of such a unit. Milk consumption was abnormally high immediately after a unit was installed in a home.

To verify reported milk purchases, a check of one distributor's route books was made. The only dispenser users whose purchases before installations could be checked were those who reported receiving milk, home delivered, from this particular processor prior to the installation of the dispenser. There were 18 such customers included in this study. The amount of milk reportedly purchased each week by those customers, before installation of dispensers, was 9.86 percent higher than the amount shown by the company's route books. This difference can be attributed to store purchases in addition to purchases by retail home delivery. Also, the recall period was quite long in these cases.

In reporting weekly purchases of dispenser milk, these customers reported purchases lower than the actual sales shown by the company's route books. It was difficult to arrive at per capita consumption figures in cases where families varied their weekly purchases between one and two, two and three, or three and four cans of milk. The weekly purchase pattern was not as uniform as with a bottled retail delivery system and therefore per capita data were difficult to determine. A variation of one can from one week to the next would result in a significant percentage change in per capita consumption.

The per capita data in this study were based on consumption within the home. In addition to dispenser milk it included bottled milks, fluid chocolate products, buttermilk, and skim milk.

THE HOME MILK DISPENSER MARKETS

Distributors servicing home milk dispensers in Ohio were located in Toledo, Mansfield, Bucyrus, Bellefontaine, Urbana, Piqua, and Dayton. Policies of distributors in these markets varied on many points. Some of the more important differences related to volume requirements, type of milk sold, price, services, rental fees and policies concerning removal of the dispenser.

Six distributors required customers to purchase a minimum weekly volume of six gallons of milk in order to justify installation of a dispenser. One distributor required a minimum weekly volume of 7-8 gallons and another required 10 gallons.

Figure 2. Cans of Milk for Home Dispenser Use in a Retail Route Truck

All home dispenser milk, in the Ohio markets studied, was delivered on the regular retail delivery routes and delivered three times per week. When a customer ran out of milk on weekends, or in situations where families consumed four cans per week, a special delivery was made to that customer. The problem of special deliveries was not as evident in the smaller towns where all of the customers were located relatively close to the plant.

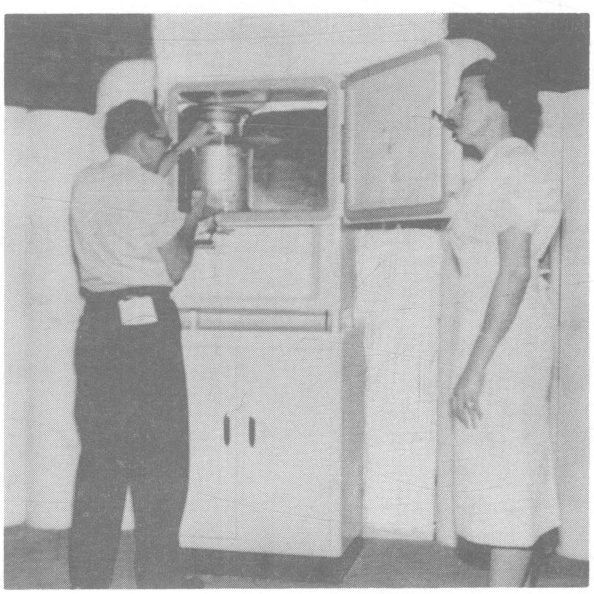

Figure 3. A Routeman Servicing a Dispenser

Four distributors sold only 3.5 percent butterfat milk for home dispenser use. For three other distributors, one sold a 2.0 percent, one a 4.0 percent and one a 4.2 percent milk in addition to the 3.5 percent milk. One distributor sold only 3.8 percent dispenser milk.

The pricing of home dispenser milk in Ohio did not follow a consistent pattern in relation to bottled milk prices. On a per gallon basis individual dairies priced their 3.5 percent dispenser milk from $.13 below to

$.04 above the 3.5 percent homogenized retail home delivered milk[4] (Table I).

TABLE I

Selling Prices Reported by Seven Distributors for 3.5 Percent Home Dispenser Milk and 3.5 Percent Retail Home Delivered Bottled Homogenized Milk, Five Ohio Markets

Type of Milk	Price Per Gallon						
Dispenser	$.87	$.78	$.80	$.86	$.82	$.75	$.79
Bottled*	.86	.88	.77	.88	.78	.88	.79

*Includes any reported quantity discount.

Source: Distributor interviews.

Part of this price variation can be attributed to the degree of competition in the home dispenser markets. In two markets, distributors offering the dispenser service were in competition. There was competition in another area, where the sales territories of two distributors overlapped to a certain extent. In two markets, there was only one seller of home dispenser milk.

The cost of a home milk dispenser was approximately $150.00. It was customary for distributors to own the dispenser and to furnish a cabinet type stand on which to place it. The cost of this stand was about $32.00. In addition, the distributor paid other costs such as interest, transfer charges, and insurance. To cover these costs, distributors received, in addition to the gallon selling price, a rental charge of $.60 per week for use of the dispenser.[5]

[4] Includes any reported quantity discount plan for bottled milk.

[5] The only deviation from this method was in one locality where a distributor sold dispensers to customers for a monthly payment of $15.00 each until the cost of the unit was repaid.

An important consideration to the distributor was the number of dispenser removals and transfers from one location to another. At the time of the study, distributors reported removals ranging from 8 percent to 60 percent. The higher averages were generally reported by the relatively small dispenser businesses. The weighted average of removals for all the Ohio markets was 17 percent for the eighteen month period. The following reasons were given for removing dispensers: moved out of sales area, space, increased milk purchases and credit, availability of cheaper milk, and several other miscellaneous reasons.

SIZE OF FAMILIES

Table II shows the number of families and number of family members in the sample by family size. The size of families contacted ranged from three to thirteen persons. There was only one family of three members included in this study. The average family size was 6.41 members. The average family size for Ohio in 1950 was 3.53.[6] It is readily apparent that the use of home dispensers is largely concentrated among the larger families.

TABLE II

Number of Families and Number of Family Members, by Family Size, Ohio Home Milk Dispenser Markets

Size of Family	Number of Families	Number of Family Members
4 members or less	16	63
5 members	18	90
6 members	26	156
7 members	19	133
8 members	11	88
9 members	6	54
10 members	4	40
11 members or more	3	36
Total	103	660

Source: Primary data.

[6] U.S. Census of Population 1950.

AGE OF FAMILY MEMBERS

A grouping of the family members by age is shown in Table III. The median age of family members fell within the 11-15 year age classification. As would be expected the Table shows the heavy concentration of persons less than 16 years old and the relatively few persons over 50 years of age.

TABLE III

Number of Home Dispenser Family Members, by Age, Ohio Home Milk Dispenser Markets

Age of Family Members	Number of Family Members	Percentage of Family Members
5 years of age or under	151	22.9
6-10 years	143	21.7
11-15 years	99	15.0
16-20 years	48	7.3
21-30 years	69	10.4
31-50 years	137	20.7
51 years of age or over	13	2.0
Total	660	100.0

Source: Primary data.

CONSUMPTION RESPONSE

The average per capita consumption before dispenser installation was 1.07 pints per person per day for the families in this survey and after installation it was 1.34 pints. This is an increase of 25.23 percent.[7] This consumption response has within it the data limitations already referred to in the methodology. Other factors should also be considered such as the rental program in Ohio which may not be the same as in other market. Also, the basis

[7]This increase is significant at the 99 percent level when tested by the sign test.

on which a dispenser was installed might have an effect on the per capita consumption within a given family. Consequently, the per capita consumption increase arrived at in this study, is probably indicative of the increase that would result in a random sample of similar size families.

The standard deviation in per capita consumption before installation was .377 pints per person per day while that after installation it was .315 pints. This represents a decrease in the dispersion about the mean, of 16.4 percent. Therefore, after dispenser installation there was more homogeneity in the various per capita consumptions of the families studied.

The per capita consumption distribution, after dispenser installation, showed considerable bimodality. This was caused by the fact that when families purchased milk in 12 quart cans, less breakdown in the size of units purchased was possible and the values tended to cluster at certain points in the distribution.

CONSUMPTION RESPONSE BASED ON PER CAPITA CONSUMPTION PREVIOUS TO DISPENSER INSTALLATION

Families whose per capita consumptions, previous to dispenser installation, were within the lower 25 percent of per capita consumptions (first quartile) were designated as Class A families. Families whose per capita consumptions, previous to dispenser installation, were within the upper 25 percent of per capita consumptions (fourth quartile) were designated as Class B families. The changes in per capita consumption for the family members in these two groups, after the installation of a dispenser, appear in Table IV.

TABLE IV

Average Per Capita Consumption, Members of Class A Families and Class B Families, Before and After Dispenser Installation, Ohio Home Milk Dispenser Markets

(Pints per person per day)

Family Class	Number of Families	Number of Members	Before Installation	After Installation	Percentage Change
A*	18	131	.64	1.22	+90.62
B**	18	105	1.57	1.54	- 1.91

*Members of families whose per capita consumptions were within the first quartile before installing dispenser.

**Members of families whose per capita consumptions were within the fourth quartile before installing dispenser.

Family members in the Class A group had an average increase in per capita consumption, after dispenser installation, of 90.62 percent.[8] Family members in the Class B group had an average decrease in per capita consumption of 1.91 percent.[9] This indicates that families with relatively low per capita consumptions had the largest increases after the installation of the home dispensers. The rate of consumption remained relatively stable among families whose consumptions previous to dispenser installation were relatively high. This also partially explains the decrease in dispersion in per capita consumptions after dispenser installation, The families at the lower end of the distribution increased their consumption significantly.

[8]This increase is significant at the 99 percent level when tested by the sign test.

[9]This decrease is not significant at the 95 percent level when tested by the sign test.

EFFECT OF FAMILY AGE PATTERN ON CONSUMPTION RESPONSE

Families with over 50 percent of their members less than 13 years of age were designated as Class C families. Families with 50 percent of their members below 13 years of age and 50 percent over 13 years of age were designated as Class D families. Families with over 50 percent of the members older than 13 years of age were designated as Class E families. The resulting average per capita consumption increases of members of families grouped according to this age pattern appear in Table V.

TABLE V

Average Per Capita Consumption of Family Members, Before and After Dispenser Installation, All Families and by Family Age Pattern, Ohio Home Milk Dispenser Markets

(Pints per person per day)

Family Class	Number of Families	Number of Members	Per Capita Consumption Before Installation	Per Capita Consumption After Installation	Percentage* Increase
C**	32	240	1.09	1.29	18.35%
D***	15	77	1.07	1.33	24.30%
E****	25	148	1.06	1.44	35.85%
All Families	72	465	1.07	1.34	25.23%

*All increases are significant at the 99 percent level when tested by the sign test.

**Families with over 50 percent of members less than 13 years of age.

***Families with 50 percent of members less than 13 and 50 percent of members older than 13 years of age.

****Families with over 50 percent of members older than 13 years of age.

Source: Primary data

Table V suggests that the consumption response from the home milk dispenser was greater, for members of families above 13 years of age than for members below 13 years of age.

CONSUMPTION RESPONSE BY SIZE OF FAMILY

The families were placed in the following size categories: 4 members or less, 5-6 members, 7-8 members, and 9 members or more. The average per capita consumption, before and after dispenser installation, was then determined for the members of the families in each group. The resulting values appear in Table VI.

TABLE VI

Average Per Capita Consumption of Family Members Before and After Installation of Home Dispenser, by Size of Family

(Pints per person per day)

Family Size	Per Capita Consumption		Percentage* Increase
	Before Installation	After Installation	
4 members or less	1.14	1.57	37.72
5-6 members	1.18	1.43	21.19
7-8 members	1.04	1.31	25.96
9 members or more	.91	1.15	26.37

*All percentage increases are significant at the 99 percent level when tested by the sign test.

Source: Primary data.

The family size of 4 members or less was found to have the largest consumption increase after dispenser installation. It was pointed out above that the consumption response, after dispenser installation, was found

to be quite large among the older members of the family. Since these families are normally composed of two children and two adults, the influence of the adults' increased consumption manifested itself, to a larger degree in this size family than in any other size of family. Also the volume requirements of processors would most likely affect this group more than the larger families and thus alter consumption levels. No further analysis was made of the use of this milk by these families.

CONSUMER ATTITUDES TOWARD THE HOME MILK DISPENSER

The respondents in this study were queried concerning their main likes and dislikes of the home milk dispenser and the bulk retail delivery system involved in this type of distribution. The methods of purchasing milk previous to dispenser installations must be considered when analyzing consumer attitudes. For instance, "availability" is ranked sixth among principle likes. Families purchasing milk in stores, previous to dispenser installation, ranked this feature higher than those families which, previous to dispenser installation, received milk by retail home delivery. The following is the list of purchase methods, previous to dispenser installation by the families in this study.

Purchase Method	Number of Families
Retail delivered from same distributor that serviced dispenser	49
Purchased milk in stores	20
Retail delivered from different distributor	19
Both retail delivered and store	10
Retail delivered from two distributors	5
Total	103

Figure 4. A Dispenser Makes Milk Readily Available

The following is the list of principal likes reported by respondents followed by the percentage of times mentioned, in relation to the total expression of principal likes.

Principal Like	Percent of Total Expression
Convenience	33.1
Colder milk	15.3
No bottles or cartons	14.5
Easier to obtain milk	9.3
Better flavor	7.6
Availability	5.1
Less waste	3.4
Increased refrigerator space	2.5
Cheaper milk (either at present time or eventually)	2.5
No mess	1.7
Less wear and tear on refrigerator	1.7
Cleaner milk	1.7
Children drink more milk	.8
Everything	.8
Total	100.0

The principal dislikes concerning home dispensers would be more meaningful if the list included comments from families who had dispensers removed from their homes for one reason or another. It was not feasible to include such families in this study. However, it appears that a certain amount of value can be obtained from the list of principal dislikes of present dispenser users.

The following is the list of principal dislikes reported by respondents followed by the percentage of times mentioned in relation to the total expression of principal dislikes.

Principal Dislike	Percent of Total Expression
None	60.3
Changing cans	9.7
Space	7.2
Cost of dispenser	4.8
Cannot determine level of milk in container	2.4
Spilling milk by baby	2.4
Milk drips from tube once in a while	2.4
Defrosting	2.4
No place for water when defrosting	1.2
Novelty to visitors is bothersome	1.2
Scheduling deliveries is difficult when more than three cans per week are consumed	1.2
Difficult to clean space between dispenser and cabinet	1.2
After dispensing, it cannot be returned to can	1.2
Too many dirty glasses	1.2
Too easy to obtain milk	1.2
Total	100.0

SUMMARY

This publication reports on the use of bulk milk dispensers in homes. The use of this method has been limited mainly to larger size families, in this study the families averaged 6.4 members per household. Consumer reactions to the dispensers were generally favorable even though they lost a

certain amount of control over the milk supply in the home. This fact no doubt affected the per capita consumption responses found in this study.

Distributors used a somewhat flexible policy relative to the volume requirements for the consumer. The penalty for not meeting volume requirements was possible removal of the dispenser. Volume requirements ranged from 6 to 10 gallons per week. The larger volume requirements were associated with distributors having large size families as dispenser customers. There was evidence of actual dispenser removal for this reason, however, no close study was made of the adherence by the distributor to the specific volume requirements.

Of the 395 home milk dispenser families in Ohio approximately 200 families were contacted and 103 responded to this study either by telephone or by mail. Seventy-two families reported milk purchases before and after dispenser installations and these users were used as the basis for the determination of per capita consumption.

This study was conducted in seven Ohio markets. These markets varied considerably as to size and prices of milk charged to consumers. Generally the dispenser was owned by the processor and the customer was charged a rental of $.60 per week.

Per capita consumption increased, after dispenser installation, an average of 25.23 percent for families in this study, however this large overall average resulted mainly from significant increases by previously low volume users. Family members above 13 years of age appeared to be more responsible for these consumption increases than the younger family members. Families whose per capita consumption previous to dispenser installation was relatively low increased their per capita consumption an average of 90 percent.

Members in the family size of four or less had an average increase in per capita consumption, after dispenser installations, of 37.72 percent. The increase in consumption for the larger size families ranged from 21.19 to 26.37 percent.

The principal likes reported by consumers concerning the home milk dispenser were "convenience", "colder milk", "no bottles or cartons", and "easier to obtain milk". The principal dislikes were "none","changing cans", "space", and "cost of dispenser".

No detailed analysis was made to determine the final use of the dispenser milk. Because of the nature of this system of distribution the sales of other dairy products could have been reduced so as to use up the milk remaining in the dispenser at the time of delivery.

This analysis indicates fresh milk sales per capita can be increase when larger volumes of milk are placed in the home. This is particularly true for those families whose per capita purchases are relatively low. For families with high consumption rates this system resulted in very little change.